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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/658,178	09/09/2003	Harry W. Sarkas	2000US01 C	3345
26589 7590 04/30/2008 WILDMAN HARROLD ALLEN & DIXON LLP 225 WEST WACKER DRIVE, SUITE 2800 CHICAGO, IL 60606				
EXAMINER MAYEKAR, KISHOR				
ART UNIT 1795		PAPER NUMBER		
MAIL DATE 04/30/2008		DELIVERY MODE PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/658,178

Applicant(s)

SARKAS ET AL.

Examiner

Kishor Mayekar

Art Unit

1795

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

1. Applicant's arguments with respect to claims 2-7 have been considered but are moot in view of the new ground(s) of rejection. The new ground(s) of rejections uses the same references in the rejections of claims in the re-exam applications 90/006946 and 90/007987.

Claim Rejections - 35 USC § 112

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 2, 4 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, the recitation "the area" lacks antecedent basis. And the recitation "the plasma is expanded into a field free zone" is confusing as whether "a field free zone" is the same zone recited in the introducing step or another"

In claim 7, the recitation "the plasma is generated by a transferred arc" is confusing since its independent claim 2 recites the generating of the plasma by a free-burning electric arc. The same is applied to claim 4.

Claim Rejections - 35 USC § 103

4. Claims 2-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pirzada et al. (US 5,788,738) in light of Boulos ("The inductively coupled R.F. (radio frequency) plasma", Pure & Appl. Chem., Vol. 57, No. 9, pages 1321-1352, 1985) and further in view of Sheer et al. (US 3,644,782) and/or Applicant's admission. Pirzada's invention, a reference cited in the last Office action, is directed to a method of producing nanoscale powders by quenching of vapors. Pirzada discloses in Example 5 the producing of stoichiometric cerium oxide powder in a size of 5-25 nm from a RF plasma wherein the producing comprises the steps of suspending a precursor of cerium oxide powder in a mixture of argon and oxygen, injecting the suspension to a thermal reaction chamber where it is vaporized by the input of thermal energy, quenching the vaporized suspension to form the 5-25 nm powder, wherein the source of the thermal energy is "internal energy, heat of reaction, conductive, convective, radiative, inductive, microwave, electromagnetic, direct or pulsed electric arc, nuclear, or combinations thereof, so long as sufficient to cause the rapid vaporization of the powder suspension being processed" (col. 6, lines 8-37 and Example 5). Boulos is relied upon for teaching the radial distribution of the magnitude of the induced electric current, current density and electrical conductivity in an argon induction discharge of a RF plasma (Fig. 10), and the particle trajectories for particles injected into an induction plasma (Fig. 29). As shown in Boulos' Fig. 10, there is induced electric field, current density and electrical conductivity even at less than 10 mm from the

center of the plasma. And as shown in Boulos' Fig. 29, in five of the six trajectories, the particles move away from the center of the plasma. The particles that move away from the center would be in a current carrying region. The difference between Pirzada in light of Boulos and the above claims is the provision of a free-burning electric arc for generating the plasma and the feeding of a precursor material into an arc column of a free-burning plasma. Sheer teaches the injection of particles entrained in a carrier gas into a cathodic column of a free-burning electric arc where the particles can be vaporized and recondensed to form finer particles (Figs. 2, 3 and 8; col. 3, lines 29-50; col. 4, lines 23-42; and col. 6, lines 1-30). And Applicant admits in the section "Background of the Invention" that such plasma generating and the feeding, in addition to RF plasma and microwave, are known and conventional. The subject matter as whole would have been within the level of ordinary skill in the art at the time the invention was made to have modified Pirzada's teachings as suggested by Sheer and/or admitted by Applicant because the selection of any of known equivalent plasma generating devices would have been within the level of ordinary skill in the art.

As to the subject matter of claim 2, there will be inherently both forced and natural convection of oxygen into Pirzada's plasma. The natural convection will occur due to temperature profile in the plasma as shown in Boulos' Figs. 11-14, 23, 25 and 26. The forced convection will occur due to the combination of the temperature profile in the plasma with the flowing of the oxygen into the plasma.

5. Claims 2-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chase (US 3,743,708) in light of Boulos and further in view of Sheer '782 and/or Applicant's admission. Chase discloses the producing of stoichiometric antimony oxide having a diameter of 14.2 nm (Example 3), wherein the forming is by suspending antimony oxide powder in a stream of oxygen gas, introducing the suspension into a RF plasma where it is vaporized by the input of thermal energy, quenching the vaporized suspension to form the 14.2 nm powder (col. 2, lines 46-52 and paragraph crossing cols. 2 and 3). The difference between Chase in light of Boulos and the above claims is the provision of a free-burning electric arc for generating the plasma and the feeding of a precursor material into an arc column of a free-burning plasma. Sheer teaches the injection of particles entrained in a carrier gas into a cathodic column of a free-burning electric arc where the particles can be vaporized and recondensed to form finer particles (Figs. 2, 3 and 8; col. 3, lines 29-50; col. 4, lines 23-42; and col. 6, lines 1-30). And Applicant admits in the section "Background of the Invention" that such plasma generating and the feeding, in addition to RF plasma and microwave, are known and conventional. The subject matter as whole would have been within the level of ordinary skill in the art at the time the invention was made to have modified Chase's teachings as suggested by Sheer and/or admitted by Applicant because the selection of any of known equivalent plasma generating devices would have been within the level of ordinary skill in the art.

As to the subject matter of claim 2, there will be inherently both forced and

natural convection of oxygen into Chase's plasma. The natural convection will occur due to temperature profile in the plasma as shown in Boulos' Figs. 11-14, 23, 25 and 26. The forced convection will occur due to the combination of the temperature profile in the plasma with the flowing of the oxygen into the plasma.

Response to Arguments

6. Applicant's arguments filed 31 January 2008 have been fully considered but they are not persuasive because of the new ground of rejections as set forth in the paragraphs above.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kishor Mayekar whose telephone number is (571) 272-1339. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kishor Mayekar/
Primary Examiner, Art Unit 1795